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Bold factors influencing Indonesian processed cocoa export to major importing countries; Do export promotion agencies matter?

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ABSTRACT

The role of ITPC (Indonesia Trade Promotion Center) as an export promotion agency has begun to be questioned due to the fluctuation in Indonesia's non-oil and gas export value. Some of the ITPCs are in major importing countries of Indonesian cocoa. This study aims to analyze the factors influencing Indonesian processed cocoa exports (HS1803/cocoa paste) to major importing countries, with a focus on the effect of ITPC, Indonesia's export promotion agency, in foreign countries. The types of data used are secondary data from 2005 to 2022, which involve the top seven importing countries: Malaysia, China, India, the United States, Brazil, Germany, and the Philippines. The data were analyzed using the gravity model. The data were obtained from various sources, including Statistics Indonesia, the World Bank, WITS, the Ministry of Industry, and other relevant institutions. Data processing was conducted by using panel data regression with EViews 10. Real exchange rate and the Indonesian Trade Promotion Center (ITPC) had a positive and significant impact on Indonesia's processed cocoa exports The ITPC dummy variable in the estimation of the model has a coefficient of 1.047, which means that if there is an ITPC in the destination importing country, the export value of Indonesian cocoa will be higher by as much as 104.7 percent compared to the importing destination country without ITPC Generally, the result of this research can be a recommendation to continue the existence of ITPC. The presence of ITPC will establish market intelligence and facilitate the export of processed cocoa to importing countries.

Keywords:
Export promotion agencies, Export value, Gravity model, Processed cocoa

1. Introduction

Along with coconut, palm oil, tea, and essential oils, cocoa is considered one of Indonesia's promising plantation commodities. Cocoa production has shown a consistent upward trend although it still need quality improvement to meet industry standard [1]. The significant potential of cocoa is attributed to the variety of products that can be derived from this commodity. Cocoa can be processed into various food products, beverages, cosmetics, and medicines. In general, cocoa can be processed into cocoa powder, cocoa butter, and cocoa candies, which are then processed into various other types of products. The variety of cocoa products and their benefits are the main reasons for the high demand for cocoa worldwide, especially from subtropical countries that are not suitable for cocoa cultivation from an agronomic perspective. The high contribution of cocoa toward national economy can be shown from improving of devise, providing of job occupation, and increasing of Farmer's income. This condition makes cocoa commodity has potential opportunity to be continuously developed for optimal result. So that it is needed some of researches related to cocoa as one of potential commodities in Indonesia.

The export market share of Indonesian cocoa covers all continents in the world, with the main market being the Asian continent. There are five importing countries of Indonesian cocoa, namely Malaysia, China, India, the United States, and the Philippines. Indonesian cocoa exports to Malaysia have the highest value compared to other countries, amounting to 55.91 thousand tons (14.61 percent) with a value of US$ 132.57 million. In second place is China with an export volume of 51.76 thousand tons (13.52 percent) valued at US$ 135.85 million. Next is India with an export volume of 50.38 thousand tons (13.17 percent) valued at US$ 151.97 million. The United States is in fourth position with an export volume of 47.00 thousand tons (12.28 percent) valued at US$ 215.91 million. In fifth place is the Philippines, with an export volume of 20.44 thousand tons (5.34 percent) valued at US$ 46.92 million [2].

There are six cocoa-related categories listed under the four-digit Harmonized System (HS) codes. These include: HS 1801 for cocoa beans (whole or broken, whether raw or roasted); HS 1802 for cocoa shells, husks, skins, and other residues; HS 1803 for cocoa paste (with or without fat removal); HS 1804 for cocoa butter, fat, and oil; HS 1805 for cocoa powder without added sugar or sweeteners; and HS 1806 for chocolate and other food products containing cocoa.. Most of Indonesian Cocoa is exported in the form of Cocoa paste, whether defatted (HS1803), Cocoa Shells, husks, skins and other cocoa waste (HS1803), and cocoa butter, fat and oil (HS1804).

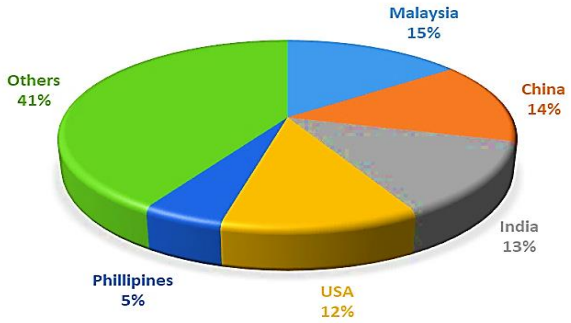

Figure 1. Export volume of Indonesian cocoa to major importing countries [2]

To encourage downstream process of commodities in Indonesia, Government released export tax policy which was applied in April 2010. This policy is expected to push Indonesian cocoa industry and followed by improving income and welfare of all stake holders especially cocoa farmers. Cocoa industry development is expected to have a big impact to farmers since Most of cocoa plantation are smallholder plantation area. In 2021, 99 percent of cocoa plantation is managed by smallholder farmers and only 1 percent is managed by government and private plantation. By applying the export policy, the production of processed cocoa is expected to be increased, export value of processed cocoa is also getting higher especially for HS1803, HS1804, HS1805 which are mostly produced by Indonesian cocoa industry.

Cocoa paste (HS1803) is one of the main exports processed cocoa from Indonesia. More than 40 percent of Indonesian cocoa paste is exported to Malaysia. Indonesian cocoa paste is known having a good quality compared to the other processed cocoa producing countries. Kusumaningrum et al. [3] has demonstrated that cocoa paste from Indonesia, particularly that originating from Bali and East Java, exhibits superior organoleptic properties, including enhanced flavor and aroma profiles.

Export value of Indonesian cocoa paste still has opportunity to be increased since the world's need is also getting higher.

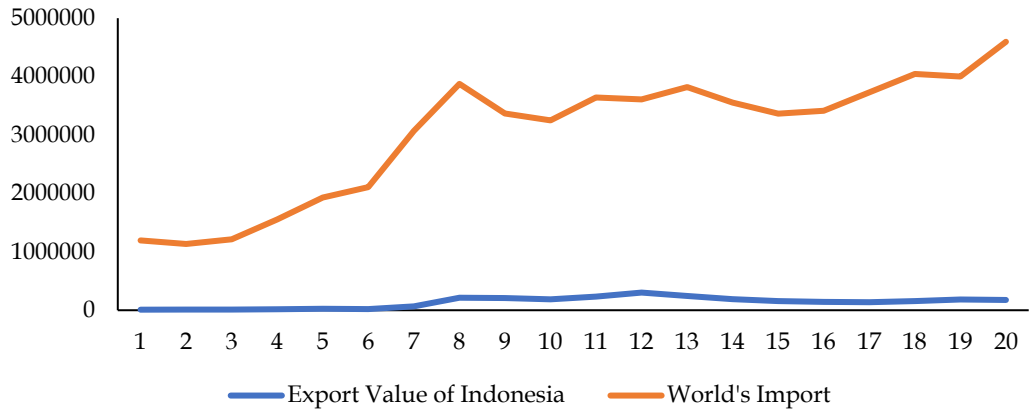

Figure 2. Export value of Indonesian cocoa paste and world's import [4]

Utilizing Export Promotion Agencies is among the government's strategies to enhance the value of Indonesia's exports. Export promotion agencies (EPA) is one of the policies to increase export value of Indonesian. Setting up representative offices serves as a strategy to boost exports in line with the export-led growth model [5]. Exporting countries need to understand their importing destination countries regarding the preferences and consumer's condition. Since obtaining information from importing countries is quite expensive, especially for Small and Medium Enterprises that are export-oriented, EPA exists to solve this problem. EPA provides market information regarding export and import, consultancy and market services, and helps firms to sell products overseas. Export Promotion Agencies play a role in building the nation's image, offering support services for exporters, and carrying out market analysis [6]. Besides that, EPA does not only provide some information for national firms but also helps foreign people who want to invest their money in EPA's home country.

The Indonesian Trade Promotion Centre (ITPC) is a type of export promotion agency of the Indonesian government that has offices in several countries. ITPS is coordinated by three Indonesian Ministries, namely the Ministry of Trade, the Ministry of Industry, and the Ministry of Foreign Affairs. Along with diplomacy, ITPC has been established in 18 countries all over the world. Those are Canada, United States of America, Mexico, Brazil, Argentina, Germany, Italy, China, India, Philippines, Nigeria, South Africa, China, Taiwan, South Korea, Japan, and Australia. Some empirical research proved that many countries got some benefits regarding the existence of export promotion agencies, including research by Kang [7], and Martincus et al. [8]. Ajija et al. [9] concluded that The presence of ITPC has a positive and significant effect on Indonesia's oil and gas exports, accounting for 22% in the global value model, 50% in developing markets, and 38% in developed ones. Based on these findings, the study recommends that the government sustain ITPC representation in importing countries.

Recently, The Role of ITPC has been questioned since the data showed that there was a decline in Indonesia's export non-oil and gas in ITPC countries and non-ITPC countries. This condition encouraged the government to evaluate the existence of

ITPC as the institution responsible for keeping Indonesia's export non-oil and gas. Indonesian Government has stated that the government would close some ITPC which had a small contribution to Indonesia export through the meeting of Ministry of trade in January 2018.

Several studies have been conducted to investigate the impact of EPA export performance. For instance, Lederman et al. [6] investigate the influence of EPA to export value across 103 developing and developed countries. Other studies have focused on a specific region or country, such as Spain [10], South Korea [7], and Indonesia [9]. While previous research has generally concentrated on overall export value, this paper investigated the effect of EPA of Indonesia (ITPC) to a particular commodity: cocoa, which is a key export product for Indonesia. This study also includes some other variables that may influence Indonesian processed cocoa exports based on gravity model theory. Therefore, the government as a policy maker can formulate a commodity-based strategy that directly addresses the issue.

2. Methods

This research discussed factors influencing Indonesian processed cocoa export to major importing countries that focus on HS Code, namely HS 1803 (cocoa paste). The types of data used are secondary data from 2005 to 2022, which involves the top seven importing countries, namely Malaysia, China, India, the United States of America, Brazil, Germany, and the Philippines. The data was obtained from many sources, namely the Statistic of Indonesia, World Bank, WITS, Industrial Ministry, and some other institutions. Data processing was conducted by using panel data regression with EViews version 10.

2.1. Pooled Data

Pooled Data is mainly used to solve problems regarding data availability because usually, we find time series data provided are too short, or cross section data are limited. Panel data can be one of the ways to find efficient estimation. A panel data set, while having both time series and cross-sectional dimensions, differs in some important respects from an independently pooled cross-section. To collect panel data, we follow the same cities, states, individuals, families, firms, or whatever across time.

Hsiao [11] mentioned some benefits of using panel data. Panel data has more degrees of freedom, variability, efficiency, and less collinearity and can accommodate dynamic adjustment and suit to study duration. To ensure the robustness and validity of the panel data estimation, several diagnostic tests were conducted to determine the most appropriate econometric model. The analysis began with the Chow Test, which was used to assess whether a Pooled Ordinary Least Squares (OLS) model or a Fixed Effects (FE) model was more suitable. A significant result indicated heterogeneity across cross-sectional units, justifying the use of Fixed Effects. Subsequently, the Hausman Test was employed to choose between the Fixed Effects and Random Effects (RE) models. This test is crucial for verifying whether the unobserved individual effects are correlated with the explanatory variables. A significant result suggests that the Fixed Effects model provides more consistent estimates.

2.2. *Gravity Model*

The Gravity model was adopted from Newton's Law [12]. This theory mentions that there is interaction between two objects that depends on their masses and the distance between them. The principle of the Gravity model was continuously used to evaluate trade flows, which was first applied in international trade research by Tinbergen and Poyhonen. The gravity model is a widely used tool in international economics, capable of explaining a large portion of bilateral trade flows across time and regions. However, it has limitations, such as assuming symmetry and homogeneity among trading partners, and it is not always effective in predicting trade flows with new or emerging partners. This study examined the bilateral trade flow patterns between Indonesia and its export destination countries. In this analysis, GDP substitutes the mass variable in Newton's Law, while distance is represented by economic distance. The gravity model equation is expressed as follows:

$$\ln EXP_{ijt} = \beta_0 + \beta_1 \ln GDP_{jt} + \beta_2 \ln POP_{jt} + \beta_3 \ln RER_{ijt} + \beta_4 \ln ECDIST_{ijt} + \beta_5 ITPC_{ijt} + \varepsilon \quad (1)$$

where:

β_0	= intercept
$\beta_1, \beta_2, \ldots, \beta_5$	= Parameter of each variable which will be tested statistically and econometrically
t	= (1,…,T) between 2005 – 2022
i,j	= (1,…,N) Bilateral trades between country i and j
EXP_{ijt}	= export value of Cocoa from country i to j in the year t
GDPjt	= GDP real per capita of country j in the year of t
POPjt	= Population of country j in the year t
RERijt	= exchange rate of country i and j in the year t
ECDIST	=The economic distance between country i and j in the year t which represents transportation cost
ECDIST	$= \frac{\text{Geographical distance x GDPj}}{\text{GDPj}}$
ITPCijt	= EPA office dummy variable country i in country j in year t. 1 if Indonesia has EPA representative in the export destination country and 0 if Indonesia doesn't have EPA representative in the export destination country
ε	= Error

3. Results and Discussion

This study analyzed 126 datasets, with the selection of the appropriate estimation model guided by a series of econometric tests. First, the Chow test was employed to assess whether the Common Effect Model (CEM) or the Fixed Effect Model (FEM) was more suitable. Subsequently, the Hausman test was conducted to determine the preference between the FEM and the Random Effect Model (REM). Lastly, the Lagrange Multiplier test was utilized to evaluate the choice between the REM and the CEM.

The Chow test shows that the probability value of the model is 0.0000. This result means that FEM is a better model than CEM. Therefore, the data analysis can be

continued to run the random effect model (REM) and Hausman test to choose either FEM or REM.

Table 1. The estimation results fixed effect model (FEM)

Fixed Effect Model			
Variable	**Coefficient**	**t-statistic**	**Prob**
C	9.692352	0.080524	0.468
LNGDPjt	-2.437467	-0.754728	0.226
LNPOPjt	-1.662664	-0.246499	0.40285
LNRER	4.695266	1.876331	0.0316
LNECDIST	-5.180085	-1.022687	0.1543
ITPC	1.047410	1.122330	0.13205
Rsquare		50.96%	
Chow test	Prob = 0.0000 < 0.05		

Table 2. The estimation results of the random effect model (REM)

Random Effect Model			
Variable	**Coefficient**	**t-statistic**	**Prob**
C	-5.659357	1.565178	0.1202
LNGDPjt	0.602769	-1.695317	0.0926
LNPOPjt	-0.542479	1.035683	0.3024
LNRER	18.99680	-0.693512	0.4893
LNECDIST	-2.461817	-1.901246	0.0597
ITPC	-1.527684	-0.459353	0.6468
Rsquare	13.76%		
Hausman test	Prob = 0.0000 < 0.05		

Based on the statistical analysis result, the probability value of Hausman test is 0.000 which is less than P value 5%. It means that the fixed effect model is the best model that can be used to estimate the relationship between export value and independent variable (GDP importing countries, Population importing countries, real exchange rate, economic distance and dummy ITPC. The structural equation can be written as follows:

$$\ln EXP_{ijt} = 9.692352 - 2.437467\ \ln GDP_{jt} - 1.662664\ \ln POP_{jt} + 4.695266\ \ln RER_{ijt} + -5.180085\ \ln ECDIST_{ijt} + 1.047410\ ITPC_{ijt} + \varepsilon$$

FEM estimation results for the analysis of the influence of real GDP, importing countries population, real exchange rate, economic distance and ITPC (as representative of exporting promotion agencies) to export value shows probability value of F statistic 0.000. This means that the model is significant. Therefore, it can be concluded that real GDP, importing countries population, real exchange rate, economic distance and ITPC as Indonesia's EPA simultaneously affect the value of Indonesian Processed Cocoa Export. R square = 50.96% means that the 50.96 % variation of export value can be explained by GDP importing countries, Population importing countries, real exchange rate, economic distance, and ITPC. While the remaining variation in export values is explained by the other variables.

Specifically, it is known that variable real exchange rate (RER) and ITPC has positive significant effect to export value of Indonesian Processed Cocoa at 5% and 15% significance level. GDP, importing countries' population and economic distance has negative impact but not significant to export value.

The estimation results in this study indicate that real exchange rate has positive effect on export value of Indonesian processed cocoa. The real exchange rate has a coefficient 4.695266, which means an increase of 1% of the real exchange rate will increase the value of exports 4.695266%. This result align with the findings of Urgessa [13] and Agbolosoo et al. [14] that investigated the influence of exchange rate volatility on export earnings for Ethiopia and Indonesia exports. The same result was also found in analysis for USA export to BRICS country [15] and for Sub Saharan Africa that investigated countries such as Madagascar, Namibia, Ghana, Mauritius, Tanzania, Mozambique and Sierra Leone [16]. Exchange rates are one of the key policies for managing the economy and one of the determinant export values. When the real exchange rate is depreciated, the production cost for domestic producers will fall relatively to foreign producers. It makes the domestic producer more competitive than the foreign market. On the other hand, when it is appreciated, exports become less competitive. We expect a positive sign for exchange rates because the depreciation of the home country relative to the foreign country's currency will lead to more exports and less exports for the home country.

The ITPC dummy variable in the estimation of the model has a coefficient of 1.047, which means that if there is an ITPC in the destination importing country, the export value of Indonesian cocoa will be higher by as much as 104.7 percent compared to the importing destination country without ITPC. This finding is in line with previous researches which were conducted by Ajija et al that analyzed the influence of export promotion agencies on Indonesian trade [9], Kang [7] who analyzed the effect of export promotion agencies on Korean trade. This research concluded that there is a positive value and significant effect of EPA in increasing the export value of destination importing countries. Hapsari et al. [17] also conducted research regarding the effect of ITPC, specifically in ITPC Chicago. The result stated that the trade balance of non-oil and gas commodities from Indonesia to the USA was influenced positively and significantly by ITPC. Kusumaningrum et al. [3] found that EPAs have a positive effect and are significant in increasing export value. The other specific regional research also showed a similar result. EPAs have a positive impact in increasing export value in Spain [11], Peru [5], and South Korea [4]. The findings of this research show that one of the government efforts stated in RPJMN (National Medium Term Development Plan) 2015-2019 can be achieved. One of the government programs stated in RPJMN 2015-2019 is to increase the export value of non-oil and gas commodities. This program is conducted by enhancing the effectiveness of market intelligence, export assistance, and promotion activities, which are part of ITPC's task as an Indonesian representative regarding international trade affairs.

GDP has a negative coefficient and no significant effect on export value. These findings are inconsistent with most of the prior research, which typically identifies a positive relationship between GDP and trade value. According to Assoua et al., the GDP of the importing country has a positive and significant effect on Cameroon's cocoa export performance [11]. These findings are in line with the research conducted by Ajija et al. [9], which examined the determinants of Indonesia's oil and gas export

performance. GDP plays a relatively less significant role in determining the trade flow of export commodities. Some importing countries process cocoa paste as raw material and export the product to other countries. Therefore, the GDP of importing countries will not directly affect the export value.

The statistical analysis also showed that the population has a negative but no significant effect on increasing export value. A similar result was also found Rompone et al. [19]. It was suspected that the processed cocoa (HS1803) is not directly consumed by the population. Therefore, the increasing population will not directly affect export value. Bergstrand [20] stated that economic distance does not exert a significant effect, possibly due to advancements in technology that reduce transportation costs between countries. Additionally, the impact of population on trade may vary depending on the estimation period. In the short term, population growth may positively influence trade flows by expanding the labor force, enhancing specialization, and increasing the variety of products available for export.

The economic distance between the capital city of two countries has a negative effect but not significant on Indonesian cocoa export value. The coefficient value is -5.180 which means that the increasing of economic distance as much a 1 percent will increase the export value as much 5.180%, assuming ceteris paribus. This result aligns with the research of [19]. The economic distance doesn't have a significant effect because technology may reduce the transportation cost between countries.

4. Conclusion

This study primarily seeks to examine how the establishment of the Indonesian Trade Promotion Center affects the export value of processed cocoa from Indonesia. ITPC is the main interest variable; meanwhile, the other variables are GDP importing countries, real exchange rate, and economic distance. The result of this study shows that ITPC has a positive and significant impact on the export value of Indonesian processed cocoa export. The existence of ITPC will increase the export value by as much as 104.7%. Besides that, the real exchange rate also has a positive and significant effect on the export value of Indonesia's processed cocoa export. The real exchange rate has a coefficient level of 4.695266, which means an increase of 1% of the real exchange rate will increase the value of exports by 4.695266%. Generally, the result of this research can be a recommendation for the Indonesian government to continue the existence of ITPC. The presence of ITPC will set up market intelligence and make it easier to export processed cocoa to importing countries. Beyond the cocoa industry, these findings have broader policy implications. Trade promotion centers like ITPC could be effectively leveraged to boost exports of other value-added agricultural and industrial commodities. Government might consider expanding the ITPC model or replicating it for other strategic sectors to diversify and strengthen Indonesia's export base. It is recommended for future research to study the effect of ITPC on other processed cocoa exports like HS1804 (cocoa butter) and HS1805 (cocoa powder).

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